

The fungi were kept by Frost in paper boxes or glued flat to sheets of blank books. It is said that these were considerably disturbed soon after his death by visiting botanists. A number of the fleshy forms were much injured by mould but none was wholly destroyed, so far as I know. The specimens of *Boletii*, probably the cream of the entire collection, have been most generously placed at my disposal by the university authorities for critical examination, and the results of this study will be published in a short time.

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## REVIEWS

### Lewis's Plant Remains of the Scottish Peat Mosses\*

This study by F. J. Lewis of the plant remains of the Scottish peat bogs, of which Part 3 dealing with the eastern and northwestern Highlands, Shetland Islands, Outer Hebrides, etc., has just reached this country, is a model in English of the line of work so successfully pursued by Nathorst, Gunnar-Andersson, and others of their countrymen, but published for the most part in Swedish and Danish and consequently inaccessible to most students. While the sequence of events as found by Lewis in Scotland is somewhat variable as would be naturally expected when the varying physical conditions of deposition are taken into account, the general order is sufficiently uniform to enable him to make some very interesting correlations between the different areas.

The following is a somewhat generalized abstract of this march of events in the late Pleistocene: The oldest beds found (exclusive of the rock floor) are glacial sands and till which are referred to the fourth Glacial or Mecklenburgian stage. These are followed by deposits containing arctic plants, indicating tundra conditions. Upon these are superposed the peat deposits of the fourth Interglacial period with *Betula*, *Corylus*, *Potentilla*, *Menyanthes*, *Salix*, etc. This forest bed or scrub is gradually exterminated by *Sphagnum* and the indicated wet moorland condition persists to the fifth

\* The Plant Remains in the Scottish Peat Mosses. By F. J. Lewis. Part 1, Trans. Royal Soc. Edinb. 41<sup>3</sup>: 699-724. pl. i-vi. 1905; Part 2, *Ibid.*, 45<sup>2</sup>: 335-360. pl. i-v. 1906. Part 3, *Ibid.*, 46<sup>1</sup>: 33-70. pl. i-iv. 1908.

Glacial or Turbarian stage, represented by mountain glaciers, and arctic valley floras, at least towards its close. These consist largely of the herbaceous arctic willows such as *Salix reticulata* and *herbacea* with *Dryas octopetalata*, etc. The fifth interglacial is marked by a gradual amelioration of temperature, the arctic willows being replaced by a close growth of *Salix arbuscula* with *Potentilla comarum*, *Empetrum nigrum*, *Arctostaphylos alpina*, and other sub-arctic forms until finally the moor is converted into a forest with *Betula alba* or *Pinus sylvestris* predominating, the latter with an undergrowth of *Calluna*. These conditions are followed by increasing humidity and precipitation until wet moorland (*Sphagnum*) has replaced the forest and the climate becomes considerably cooler with slight alpine glaciation. Soon, however, the climate becomes warmer, more genial, and drier in fact than it is at the present time, and another forest of *Pinus sylvestris* of large size and with an undergrowth of *Calluna* and some *Corylus* and *Alnus* occupies the region. † Succeeding the pine forests is another era of wet moorlands (*Sphagnum*, *Scirpus*) which gradually changed to the present somewhat drier condition.

While it is regrettable that all of the plant forms discovered have not been identified and listed and while the manner of presentation is susceptible of improvement, the study as a whole is an extremely valuable one and shows the possibilities in a line of work almost wholly neglected in America. It is to be hoped that it will furnish a stimulus to botanists favorably situated in our own northern states and induce them to get a little way below the surface in their ecological studies.

EDWARD W. BERRY.

JOHNS HOPKINS UNIVERSITY.

### AN EDITORIAL PLEA

A contemporary magazine writes as follows: We cannot expect the "man who pays" to continue to pay unless he receives value for his money, but the value of a scientific journal, unlike that of a popular magazine, is dependent entirely on gra-

† Proximity to the Atlantic caused the wet moorland to persist in western Scotland at this time.